

consistent with an accepted, revised band plan that is standard throughout the world; the League now recommends the following:

(1) Consistent with the frequency privileges and other operating limitations applicable to the license class of the operator, any amateur station may be operated under automatic control using any accepted protocol for data transmissions within the frequency segments specified in the attached appendix. Such stations should be equipped with means to limit transmissions to no more than five minutes in the event of an equipment malfunction or interruption of contact with another station. Third party communications may be transmitted under automatic control using any authorized emission code set forth in §97.309(a), provided that the retransmitted messages must originate at a station that is being locally or remotely controlled.

(2) HF data operation should be permitted outside those specified subbands as per current rules, but only under local (or remote) control.

Under this dual regulatory plan, automatically controlled stations transmitting data communications would be permitted to transmit only in the specified HF subbands. Stations transmitting data communications outside the specified subbands must be under local or remote control.

24. Such an arrangement would require that a licensee confine automatically controlled station functions to the specified subband, where there is less likelihood of unexpected interference with other amateur communications using incompatible modes. Data communications under local control, where the operator would ascertain that no interference is likely to ongoing communications before transmitting, and to monitor the progress of communications, could be conducted, consistent with volunteer bandplans, anywhere the present rules permit such emissions. Within the subbands, an automatically controlled station would be required to have an

appropriate provision or mechanism to discontinue operation quickly in the event of malfunction or loss of contact with another station, as current rules for automatic control now require. Cooperative use of frequencies and the exercise of station control demand no less.

25. The League has proposed the instant approach for authorization of HF automatic control after much study and discussion, and based upon a recent, significant reconfiguration of the band plan for such operation agreed upon by IARU Region 2, representing 38 amateur radio societies in the Americas. The attached appendix lists, as proposed subbands for automatically controlled HF data communications, a subset of the frequencies available under the IARU band plan for such use, in order to minimize any impact on other users of the HF bands. It is firmly believed that there should be permitted some automatic control authorization at HF frequencies. It is not now apparent, and the League is not now prepared to suggest that any additional data operation under automatic control be permitted at HF outside the proposed subbands, though further study of the matter is ongoing. Thus, at present, regardless of the function of the automatically controlled HF data station in a network, and whether it is being interrogated by a locally controlled station or is part of a series of automatically controlled links, all such operation should be limited to specific subbands. This plan will permit all amateurs the flexibility to experiment with digital communications modes and

their applications, while protecting other stations against undue interference.

26. The specified subbands contained in the attached Appendix should not suffer the same criticism levied by certain commenters in RM-7248. The newly revised IARU Region 2 band plan has provided for subbands for automatically controlled HF data communications that are consistent worldwide, and are small enough to minimize displacement of established operating patterns using other modes. Because the proposed subbands are consistent with amateur practice worldwide, it is unlikely that the rule-imposed mode subbands would soon be rendered obsolete by changes in operating patterns. The provision of small subbands for automatically controlled HF data operation would, as well, serve to encourage the development of and conversion to newer technologies by amateurs as more, and newer, digital modes are introduced and more amateurs shift to digital communications. The League believes that the gradual development of amateur radio operating patterns will continue to occur; that these changes should be due to natural migration as a larger percentage of amateurs shift to digital modes; and that the Amateur Radio Service should be permitted to develop and explore these various modes, and their capabilities. These adjustments and sharing arrangements should be facilitated by the regulatory approach set forth herein. Such will allow specific subbands to support networks of automatically controlled stations, and, in addition, a flexible regulatory environment outside those subbands, where locally controlled stations can operate using available modes.

VIII. Enforcement Issues

27. In addition to concerns about interference prevention, a few of those who filed comments in RM-7248 expressed concern about possible abuses, or unlawful use of the data networks. They asked whether automatically controlled HF data operation would contribute to such a problem, or at least make enforcement difficult. The concern about abuses related principally to third-party traffic communications. The League is not aware of any pattern of such abuse, nor does it see any reason why unlawful operation is any more likely while a station is under automatic control than when two stations are operating under local control. Automatic control does not equate to an absence of control, nor diminish the responsibility of a licensee or control operator. Current rules as to a licensee's obligation to assure proper control are sufficient to inhibit any unlawful operation.²²

28. The Commission authorized automatic control of amateur digital communications on and above the amateur 50 MHz band in 1986. Such stations were authorized to retransmit third-party traffic. That authorization now appears at Section 97.109(e) of the Rules, but limits such retransmission to packet stations using the AX.25 protocol. In adopting that authorization, the Commission

²² See, §§97.103 and 97.105(a) of the Rules. These rules are not proposed herein to be changed. It is the League's understanding that the Commission is considering commencement of a rule making proceeding dealing with control operator responsibility, but that is a separate issue not directly related to whether or not automatic control should be permitted for HF data operation.

quoted the League, relative to supervision of station transmissions, stating as follows:

The question of risk versus benefit in considering manual control throughout an amateur packet network while handling third party traffic should be resolved in favor of the benefit of the efficient functioning of the network. In the opinion of the League, the widespread public benefit of having a high-speed packet radio network with the capacity of handling major emergencies far outweighs the narrow risk of unsupervised use of the network by unlicensed persons.

61 RR 2d 347, at 348 (1986)

This same rationale is applicable to other digital communications as well as packet radio transmissions. The League, during the period of the special temporary authority for HF automatically controlled stations, noted no instances of initiation of messages by non-amateurs. That was the stated concern of the Commission in addressing the issue of automatic control of digital communications in 1986.²³ It has proven, both at VHF and UHF, and it is the experience of the League from the STA, that enforcement in this context is not a significant problem,²⁴ and certainly not one which

²³ The Commission stated in the Memorandum Opinion and Order in Docket 85-105 that "unless amateur stations which retransmit messages employ adequate safeguards, undetected use by non-amateurs of amateur frequencies is possible. Should this occur, the legitimacy of the service would be imperiled. The League is fully in support of the Commission's effort to protect the non-commercial nature of the service, and to keep unlicensed persons out. The aggressiveness of the amateur community in protecting itself against interlopers is not, however, to be underestimated as a protection factor."

²⁴ There are two sub-issues within the enforcement issue: monitorability and accountability. The first of these insures that monitoring stations, both FCC and amateur, can determine the content of the transmission. The current rules, which are not proposed to be changed herein, limit HF data operation on amateur

should inhibit the development of new data communications techniques and networks for use in emergencies.

29. Thus, the League suggests that Section 97.109, which currently prohibits automatic control of an amateur station while transmitting third party traffic (except packet stations using the AX.25 protocol on the 6-meter and shorter wavelength bands), be changed so as to permit RTTY and other data modes under automatic control on HF frequencies as well as at VHF and above.²⁵

IX. Conclusion

30. The Amateur Radio Service has greatly benefitted from the Commission's accommodation in issuing and renewing the automatic control STA. Also useful have been the STA participants, the comments in RM-7248, the recent survey conducted by the League, and most especially the work of its Committee on Amateur Radio Digital

frequencies to ASCII, AMTOR and ITA#2 coding at HF. In order to be monitorable, a digital transmission must be in plain language, in a known code (e.g. ASCII) and use known, or easily determined, modulation techniques and known protocols. As long as the transmission uses a known code and the text is in plain language, it can be monitored. Accountability is not an issue in this proceeding, as it refers to the responsibility for the content of transmissions, a broader subject not uniquely applicable to automatically controlled data communications.

²⁵ The League's proposal for revision of Section 97.109(e), to permit automatically controlled stations at HF to carry third party data traffic, would incidentally broaden the range of data communications at VHF that could be used to carry third-party traffic as well. The justification for use of data modes in addition to packet for third-party traffic at HF is applicable to third-party VHF communications as well. There would be little justification for continuing to limit stations under automatic control at VHF to the AX.25 protocol while carrying third-party traffic, while at the same time allowing a broader range of data modes to carry such traffic under automatic control at HF.

Communications. It is apparent that the amateur community favors the use of automatically controlled data stations on HF only under certain circumstances. The development and adaptation of new, efficient data technologies have been facilitated by the use of automatically controlled stations, which more than justifies the permanent authorization of such. There is, however, uniquely in the HF amateur bands, **at the present time**, a need to restrict such operation to specific, mandatory subbands, in order to avoid interference to users of other modes in the crowded HF bands. While the League's proposal for regulated subbands for automatically controlled data operation will not prevent all interference, it would insure, to the extent practicable, that interference is not created by the commencement of data transmissions from automatically controlled stations except in segments of bands where such may be expected by other users.

31. There are no significant enforcement problems associated with operation under this arrangement, and it is unnecessary to restrict the modes of data communications which can be used at HF and MF under automatic control. Nor is it necessary to preclude third-party communications, which are conducted during emergencies and in public service communications contexts. International third-party traffic rules would apply as they do to other types of amateur communications.

Therefore, the foregoing considered, the American Radio Relay League, Incorporated respectfully requests that the Commission issue a Notice of Proposed Rule Making at an early date looking

toward the authorization of automatically controlled HF data communications under certain circumstances, as per the attached Appendix.

Respectfully submitted,

THE AMERICAN RADIO RELAY
LEAGUE, INCORPORATED

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February 1, 1993

APPENDIX

1. Sections 97.109(d) and (e) are amended to read as follows:

Section 97.109 **Station Control.**

(d) When a station is being automatically controlled, the control operator need not be at the control point. Only stations transmitting RTTY or data emissions, and stations specifically designated elsewhere in this Part, may be automatically controlled. Automatic control must cease upon notification by an EIC that the station is transmitting improperly or causing harmful interference to other stations. Automatic control must not be resumed without prior approval of the EIC. RTTY and data stations operating under automatic control on frequencies below 50 MHz must use a digital code permitted in §97.309(a) of these Rules, and must incorporate provisions for discontinuing transmitter operation in the event of malfunction, or interruption of communications with another station.

(1) Stations transmitting RTTY or data may be operated under automatic control in the 6 meter and shorter wavelength bands, and in the following segments of the 10 meter and longer wavelength bands: 28.120-28.189 MHz; 24.925-24.930 MHz; 21.090-21.100 MHz; 18.105-18.110 MHz; 14.095-14.0995 MHz; 14.1005-14.112 MHz; 10.140-10.150 MHz; 7.100-7.105 MHz; or 3.620-3.635 MHz.

(e) Stations authorized by these rules to transmit RTTY or data communications under automatic control may transmit third party communications. Any retransmitted messages on behalf of any third party must originate at a station that is under local or remote control.

Automatic Unattended Operation Survey

SUMMARY OF RESULTS ATTACHED

The ARRL seeks your help for planning automated message systems below 50 MHz.

If you have comments or suggestions about planning for automated message systems operating below 50 MHz, we would like to get your views.

This issue is more complex than it appears from a casual look. Read the following explanation and definition of terms and then fill out the survey below and return it, by March 6, 1992, to Chairman, Committee on Amateur Radio Digital Communications, American Radio Relay League, 225 Main Street, Newington, CT 06111. If you need more space, please use additional sheets of paper.

In the context of digital communication, "automatic operation" means using a computer to send and receive commands and

messages over the air without direct control operator intervention. "Unattended automatic operation" means doing so without an operator being present to observe or intervene in the operation of the station.

It is possible for an unattended automatic digital station to work another station that is being controlled by an operator who is present and can listen to the frequency that is to be used to ensure that it is free before initiating a contact. In this style of operation, the frequency can be shared by more than one digital mode. Setting the frequency aside for a specific digital mode is not essential. For the purpose of this survey we will call this *semi-automatic* operation. RTTY and AMTOR MBOs typically

operate in this mode.

It is also possible for an unattended automatic digital station to work another unattended automatic station. In this style of operation, the frequency used must be set aside for the specific digital mode the stations are using at the time such communications are to take place. Sharing the frequency with another mode is not possible since there is no practical means of listening to the channel to determine if the channel is already in use by another mode of signal. For the purpose of this survey we will call this *fully automatic* operation. Packet BBSs typically operate this mode.

All digital modes are capable of either *semi-* or *fully automatic* operation.—Paul Rinaldo, W4RI

Automatic Unattended Operation Survey Questions

Please print or type.

1. Optional: Name _____ Date _____

Address: _____

2. What modes do you use (check all that apply)?

- | | |
|---|---------------------------------------|
| <input type="checkbox"/> HF Packet | <input type="checkbox"/> VHF Packet |
| <input type="checkbox"/> HF Baudot RTTY | <input type="checkbox"/> VHF FM Phone |
| <input type="checkbox"/> HF AMTOR RTTY | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> HF SSTV | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> HF CW | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> HF Phone | |

3. Do you own or act as System Operator (SYSOP) or Remote SYSOP for any of the following systems (check all that apply)?

- | | |
|--|---|
| <input type="checkbox"/> HF Packet BBS | <input type="checkbox"/> VHF Packet BBS |
| <input type="checkbox"/> HF Baudot MSO | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> HF AMTOR APLink | <input type="checkbox"/> Other _____ |

4.1 Do you think the FCC rules should permit *semi-automatic* digital station operation on the Amateur Radio HF bands?

- ☐ Yes ☐ No ☐ Maybe ☐ No Opinion

4.2 If *semi-automatic* operation is permitted on the Amateur Radio HF bands, should all frequencies where digital modes are permitted be available for *semi-automatic* operation? If not, should there be a subband within each band that is available for *semi-automatic* operation?

- ☐ Permit *semi-automatic* operation on all digital mode frequencies
- ☐ Permit *semi-automatic* operation in subbands only.
- ☐ Other _____
- _____
- _____
- _____

5.1 Do you think the FCC rules should permit *fully automatic* digital station operation on the Amateur HF bands?

☐ Yes ☐ No ☐ Maybe ☐ No Opinion

5.2 If *fully automatic* operation is permitted on the Amateur Radio HF bands, should all frequencies where digital modes are permitted be available for *fully automatic* operation? If not, should there be a subband within each band that is available for *fully automatic* operation?

☐ Permit *fully automatic* operation on all digital mode frequencies
☐ Permit *fully automatic* operation in subbands only.
☐ Other

6.1 Do you think the FCC rules should provide for protected or exclusive-use subbands for specific modes using *fully automatic* operation?

☐ Yes ☐ No ☐ Maybe ☐ No Opinion

6.2 If so, which modes do you think should receive exclusive-use subband assignments (check all that apply)?

<input type="checkbox"/> AMTOR	Future Modes:
<input type="checkbox"/> Packet	<input type="checkbox"/> Clover
<input type="checkbox"/> RTTY	<input type="checkbox"/> PACTOR
<input type="checkbox"/> Other _____	<input type="checkbox"/> Other _____

7. Please state in your own words why you made the choices you did in questions 4.1 through 6.2.

8. Is there another alternative that would be better than any of the options outlined above?

9.1 Should there be a limit on the number of stations that are permitted either *semi-* or *fully automatic* operation?

☐ No limit
☐ Limit the number of *semi-automatic* stations
☐ Limit the number of *fully automatic* stations
☐ Limit *both*
☐ Not sure
☐ No opinion

9.2 If you believe the number of *semi-* or *fully automatic* stations should be limited, what should those numbers be?

9.3 If the number of *semi-* or *fully automatic* stations is to be limited, what are the criteria that should be used to decide who will and will not be permitted such operation on the HF bands?

9.4 If the number of *semi-* or *fully automatic* stations is to be limited, what person or group should make the final decision as to who will or will not be permitted such operation on the HF bands?

10. Ten years ago, packet and AMTOR were being used by only a few people. Now they have become a major part of Amateur Radio. Today, new technology such as Clover, PACTOR, fax and digital voice are being discussed. How do we ensure that *semi-* or *fully automatic* operation of these future systems can be implemented without additional rule changes?

11. Please provide any other information that you feel would be useful on any aspect of automatic unattended operation on HF.

QST-

Survey Results 507 Respondents

2. Modes Used

HF Packet	188
HF Baudot	301
HF AMTOR	252
HFSSTV	16
HF CW	382
VHF Packet	345
VHF FM	383
Other	67

3. Act as Sysop

HFBBS	19
HFMSO	3
ApLink	19
VHF BBS	72
Other	11

4.1 Allow semiautomatic operation

Yes	291
No	140
Maybe	67
No opinion	4

4.2 Frequencies

Permit on all	148
Permit on subbands	258
Other	61

5.1 Allow fully automatic operation

Yes	174
No	261
Maybe	51
No opinion	4

5.2 Bands available

All freqs	67
Subbands only	270
Other	75

6.1 Exclusive Subbands

Yes	103
No	285
Maybe	55
No opinion	7

6.2 Modes

AMTOR	117
Packet	134
RTTY	84
Other	18
CLOVER	45
FACTOR	54
Other	15

9.1 Limit on number of stations

No limit	170
Limi Semi	5
Limit Fully	72
Limit Both	133
Not Sure	41
No opinion	15